Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1-14. (Canceled)
- 15. (Currently Amended): A <u>thermostable</u> mutant polymerase comprising a Y-GG/A amino acid motif between an N-terminal 3'-5' exonuclease domain and a C-terminal polymerase domain wherein the tyrosine of the Y-GG/A amino acid motif is substituted with another amino acid, wherein the mutant polymerase is suitable for polymerase chain reactions, and wherein the wild-type form of the mutant polymerase has at least 80 % amino acid homology to SEQ ID NO:34.
 - 16. (Canceled).
- 17. (Previously Added): The mutant polymerase of Claim 15 wherein the wild-type form of the mutant polymerase is obtainable from Euryarchaea.
- 18. (Previously Added): The mutant polymerase of Claim 15 wherein the wild-type form of the mutant polymerase is obtainable from *Thermococcus aggregans*.
- 19. (Currently Amended) The mutant polymerase of Claim 15 wherein the wild type form of the mutant polymerase is SEQ ID NO:34, and wherein the difference between the mutant polymerase and SEQ ID NO:34 the wild type form consists of the single amino acid substitution of the tyrosine of the Y-GG/A amino acid motif.
- 20. (Previously Added): The mutant polymerase of Claim 15 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an amino acid with an aromatic side chain.
- 21. (Previously Added): The mutant polymerase of Claim 20 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a phenylalanine, a tryptophan or a histidine.
- 22. (Previously Amended) The mutant polymerase of Claim 15 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an amino acid with a hydrophilic side chain.

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- 23. (Previously Amended) The mutant polymerase of Claim 22 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with an asparagine.
 - 24. (Previously Added): A DNA encoding the mutant polymerase of Claim 15.
 - 25. (Previously Added): A vector comprising the DNA of Claim 24.
- 26. (Previously Amended) An isolated host cell comprising the DNA of Claim 24 or the vector of Claim 25.
- 27. (Previously Amended) A process for obtaining a mutant polymerase comprising purifying the mutant polymerase from the isolated host cell of Claim 26.
- 28. (Previously Added): A process for synthesizing nucleic acids, comprising contacting the mutant polymerase of Claim 15 with nucleotides, a primer and a polynucleotide template under conditions suitable for elongation of the primer.
- 29. (Previously Added): A process for polynucleotide amplification comprising contacting the mutant polymerase of Claim 15 with nucleotides, primers and a polynucleotide template under conditions suitable for amplification of the polynucleotide.
- 30. (Previously presented) The mutant polymerase of Claim 21 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a tryptophan or a histidine.
- 31. (Previously presented) The mutant polymerase of Claim 22 wherein the tyrosine of the Y-GG/A amino acid motif is substituted with a serine.
- 32. (Previously presented) A polymerase chain reaction process comprising contacting the mutant polymerase of Claim 15 with nucleotides, a primer and a polynucleotide template under conditions suitable for amplification of the polynucleotide template.
- 33. (New) The mutant polymerase of Claim 15 wherein the difference between the mutant polymerase and wildtype polymerase consists of the single amino acid substitution of the tyrosine of the Y-GG/A amino acid motif, wherein the wildtype polymerase is a polymerase isolated from a bacterium selected from the group consisting of *Thermococcus aggregans*, Thermococcus litoralis, Thermococcus gorgonarius, Thermococcus furiosus, Thermococcus

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spec. 9N7, Pyrococcus abysii, Pyrococcus horikoshii, Pyrococcus spec. KOD, and Pyrococcus furiosus.

34. (New) The mutant polymerase of claim 15, wherein the mutant polymerase amplifies λ phage DNA when 1 pmol of the mutant polymerase is included in an aqueous mixture comprising 10 mM Tris-HCl/pH8.9, 75 mM KCl, 1.5 mM MgCl₂, 10 mM CHAPS, 200 μM dNTP, 10 ng λ DNA and 30 pmol of each of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 and SEQ ID NO:13 and exposed to the following amplification conditions: 2 minutes at 94°C, 10 cycles with 10 seconds at 94°C, 30 seconds at 58°C and 3 minutes at 72°C followed by 20 cycles with 10 seconds at 94°C, 30 seconds at 58°C and 3 minutes elongation at 72°C increased by 20 seconds/cycle followed by 7 minutes at 72°C.